

Deli, S.
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FILE 'CAPLUS, MEDLINE, BIOSIS, EMBASE, WPIDS, JICST-EPLUS, JAPIO, PHIC, PHIN, TOXCENTER, PASCAL, DISSABS, FEDRIP' ENTERED AT 11:49:07 ON 20 DEC 2004

L1 533 S "CONFER A"?/AU
L2 43 S "AYALEW S"?/AU
L3 10683 S "MURPHY G"?/AU
L4 72 S "PANDHER K"?/AU
L5 2 S L1 AND L2 AND L3 AND L4
L6 48 S L1 AND (L2 OR L3 OR L4)
L7 2 S L2 AND (L3 OR L4)
L8 34 S L3 AND L4
L9 378 S (L6 OR L8 OR L1 OR L2 OR L3 OR L4) AND HAEMOLYTIC?
L10 90 S L9 AND (OMP# OR OUTER MEMBRAN?)
L11 44 S L10 AND (SHIPPING FEVER OR PNEUMON?(3A) PASTEUR?)
L12 44 S L5 OR L7 OR L11
L13 13 DUP REM L12 (31 DUPLICATES REMOVED)

L13 ANSWER 1 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 2004:412758 CAPLUS

DOCUMENT NUMBER: 140:422396

TITLE: Mannheimia **haemolytica** outer
membrane protein PlpE as a vaccine or vaccine
component against **shipping fever**

INVENTOR(S): Confer, Anthony W.; Ayalew, Sahlu;
Murphy, George L.; Pandher, Karamjeet

PATENT ASSIGNEE(S): The Board of Regents for Oklahoma State University,
USA

SOURCE: PCT Int. Appl., 48 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004041182	A2	20040521	WO 2003-US34574	20031030
WO 2004041182	A3	20040812		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 2004156865	A1	20040812	US 2003-696544	20031029
PRIORITY APPLN. INFO.:			US 2002-422305P	P 20021030

AB Vaccines and methods against *M. haemolytica* infections in cattle. The vaccine comps. include a recombinant **outer membrane** protein of *M. haemolytica* designated PlpE and/or subunits thereof, alone or in combination with other antigenic components, and a carrier or diluent. The methods involve administering an effective immunizing amount of the vaccines to susceptible bovine.

L13 ANSWER 2 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2004:1056161 CAPLUS

TITLE: Characterization of immunodominant and potentially protective epitopes of Mannheimia **haemolytica** serotype 1 **outer membrane** lipoprotein PlpE

AUTHOR(S): Ayalew, Sahlu; Confer, Anthony W.;
Blackwood, Emily R.

CORPORATE SOURCE: Department of Veterinary Pathobiology, College of

SOURCE: Veterinary Medicine, Oklahoma State University,
Stillwater, OK, USA
Infection and Immunity (2004), 72(12), 7265-7274
CODEN: INFIBR; ISSN: 0019-9567
PUBLISHER: American Society for Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Mannheimia **haemolytica** serotype 1 (S1) is the most common bacterial isolate found in **shipping fever** pneumonia in beef cattle. Currently used vaccines against *M. haemolytica* do not provide complete protection against the disease. Research with *M. haemolytica* outer membrane proteins (OMPs) has shown that antibodies to one particular OMP from S1, PlpE, may be important in immunity. In a recently published work, members of our laboratory showed that recombinant PlpE (rPlpE) is highly immunogenic when injected s.c. into cattle and that the acquired immunity markedly enhanced resistance to exptl. challenge (A. W. Confer, S. Ayalew, R. J. Panciera, M. Montelongo, L. C. Whitworth, and J. D. Hammer, Vaccine 21:2821-2829, 2003). The objective of this work was to identify epitopes of PlpE that are responsible for inducing the immune response. Western blot anal. of a series of rPlpE with nested deletions on both termini with bovine anti-PlpE hyperimmune sera showed that the immunodominant region is located close to the N terminus of PlpE. Fine epitope mapping, in which an array of overlapping 13-mer synthetic peptides attached to a derivatized cellulose membrane was probed with various affinity-purified anti-PlpE antibodies, identified eight highly reactive regions, of which region 2 (R2) was identified as the specific epitope. The R2 region is comprised of eight imperfect repeats of a hexapeptide (QAQNAP) and is located between residues 26 and 76. Complement-mediated bactericidal activity of affinity-purified anti-PlpE bovine antibodies confirmed that antibodies directed against the R2 region are effective in killing *M. haemolytica*.

L13 ANSWER 3 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3

ACCESSION NUMBER: 2003:448899 CAPLUS
DOCUMENT NUMBER: 139:228863
TITLE: Immunogenicity of recombinant Mannheimia **haemolytica** serotype 1 outer membrane protein PlpE and augmentation of a commercial vaccine
AUTHOR(S): Confer, Anthony W.; Ayalew, Sahlu; Panciera, Roger J.; Montelongo, Marie; Whitworth, Lisa C.; Hammer, Jordan D.
CORPORATE SOURCE: College of Veterinary Medicine, Department of Veterinary Pathobiology, Oklahoma State University, Stillwater, OK, 74078-2007, USA
SOURCE: Vaccine (2003), 21(21-22), 2821-2829
CODEN: VACCDE; ISSN: 0264-410X
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Mannheimia **haemolytica** is the major cause of severe bacterial pneumonia associated with **shipping fever** in cattle. The gene for *M. haemolytica* outer membrane protein (OMP) PlpE was cloned into the expression vector pRSETA. The cloned gene was then expressed in BL21(DE3)pLysS and the recombinant PlpE (rPlpE) was purified and used in immunol. and vaccination studies. Vaccination of cattle with com. *M. haemolytica* vaccines stimulated no significant antibody responses to rPlpE. Recombinant PlpE in a com. proprietary adjuvant was highly immunogenic when injected s.c. into cattle. Vaccination of cattle with 100 µg of rPlpE markedly enhanced resistance against exptl. challenge with virulent *M. haemolytica*. Addition of 100 µg of rPlpE to a com. *M. haemolytica* vaccine, Presponse, significantly enhanced protection afforded by the vaccine against exptl. challenge. Addition of rPlpE to com. *M. haemolytica* vaccines could greatly enhance vaccine efficacy.

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 4 OF 13 DISSABS COPYRIGHT (C) 2004 ProQuest Information and Learning Company; All Rights Reserved on STN
 ACCESSION NUMBER: 2001:49620 DISSABS Order Number: AAI9999904
 TITLE: Exploring bovine **pneumonic pasteurellosis**
 AUTHOR: Gatto, Nicholas Thomas [Ph.D.]; Confer, Anthony W. [adviser]
 CORPORATE SOURCE: Oklahoma State University (0664)
 SOURCE: Dissertation Abstracts International, (2000) Vol. 62, No. 1B, p. 107. Order No.: AAI9999904. 131 pages. ISBN: 0-493-08483-5.
 DOCUMENT TYPE: Dissertation
 FILE SEGMENT: DAI
 LANGUAGE: English

AB Scope and method of study. The purposes of these studies were to examine the pathogenesis of *Pasteurella multocida* A:3 and *Mannheimia haemolytica* serotype 1 in bovine **pneumonic pasteurellosis**. The first study histologically and bacteriologically examined xenochimeric mice reconstituted with bovine hematology lymphoid tissues (SLID-Bo) and immunodeficient mice after intratracheal challenge with *M. haemolytica*. The second study characterized and examined the ability of a 28 kDa **outer membrane** protein (Omp28) from *P. multocida* A:3 to stimulate protective immunity in mice after a homologous intraperitoneal challenge. Findings and conclusions. Intratracheal challenge of the SLID-bo and immunodeficient mice with *M. haemolytica* will produce a neutrophilic alveolitis and bronchiolitis. Lung lesion intensity and bacterial colony forming units per gram of lung tissue decreased with time. The SCID-Bo mouse does not appear to be an adequate model for the study of bovine **pneumonic pasteurellosis**. Omp28 is a member of the **Omp-A**-porin family of proteins; however surface exposure and porin activity could not be demonstrated. Purified Omp28 stimulated a significant ($P < 0.05$) antibody response, as determined by ELISA, but was not protective against intraperitoneal challenge, and anti-Omp28 antibodies did not activate complement-mediated killing of bacteria.

L13 ANSWER 5 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
 ACCESSION NUMBER: 1999:127759 CAPLUS
 DOCUMENT NUMBER: 131:30760
 TITLE: Identification of immunogenic, surface-exposed **outer membrane** proteins of *Pasteurella haemolytica* serotype
 AUTHOR(S): Pandher, Karamjeet; Murphy, George L.; Confer, Anthony W.
 CORPORATE SOURCE: College of Veterinary Medicine, Department of Anatomy, Pathol. Pharmacol., Oklahoma State University, Stillwater, OK, 74078-2007, USA
 SOURCE: Veterinary Microbiology (1999), 65(3), 215-226
 CODEN: VMICDQ; ISSN: 0378-1135
 PUBLISHER: Elsevier Science B.V.
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB *Pasteurella haemolytica* serotype 1 (S1) is the bacterium most frequently recovered from the lungs of cattle that have succumbed to **shipping fever** pneumonia. *P. haemolytica* **outer membrane** proteins (OMPs) are important immunogens in the development of resistance to **pneumonic pasteurellosis**. The purpose of this study was to identify the repertoire of immunogenic, surface-exposed *P. haemolytica* (S1) OMPs, that could be important in the development of protective immunity. We determined surface exposure of OMPs by (1) their susceptibility to protease treatment and (2) their ability to adsorb out antibodies from bovine immune sera. For a comprehensive identification of

immunogenic, surface-exposed **OMPs**, we used bovine antisera from calves that were resistant to exptl. *P. haemolytica* challenge after (1) natural exposure to *P. haemolytica*, (2) vaccination with live *P. haemolytica*, or (3) vaccination with *P. haemolytica* **OMPs**. We identified 21 immunogenic, surface-exposed *P. haemolytica* **OMPs**. Most were recognized by all three immune sera. However, some were recognized by one or two of the three antisera. Our analyses identified surface-exposed, immunogenic proteins that were not identified in previous studies.

REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 6 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 1998:784260 CAPLUS
DOCUMENT NUMBER: 130:149350
TITLE: Genetic and immunologic analyses of PlpE, a lipoprotein important in complement-mediated killing of *Pasteurella haemolytica* serotype 1
AUTHOR(S): Pandher, Karamjeet; Confer, Anthony W.; Murphy, George L.
CORPORATE SOURCE: Department of Anatomy, Pathology, and Pharmacology, College of Veterinary Medicine, Oklahoma State University, Stillwater, OK, 74078, USA
SOURCE: Infection and Immunity (1998), 66(12), 5613-5619
CODEN: INFIBR; ISSN: 0019-9567
PUBLISHER: American Society for Microbiology
DOCUMENT TYPE: Journal
LANGUAGE: English

AB *Pasteurella haemolytica* serotype 1 is the bacterium most commonly associated with bovine shipping fever. The presence of antibodies against *P. haemolytica* outer membrane proteins (**OMPs**) correlates statistically with resistance to exptl. *P. haemolytica* challenge in cattle. Until now, specific *P. haemolytica* **OMPs** which elicit antibodies that function in host defense mechanisms have not been identified. In this study, we have cloned and sequenced the gene encoding one such protein, PlpE. Anal. of the deduced amino acid sequence revealed that PlpE is a lipoprotein and that it is similar to an *Actinobacillus pleuropneumoniae* lipoprotein, OmlA. Affinity-purified, anti-PlpE antibodies recognize a protein in all serotypes of *P. haemolytica* except serotype 11. We found that intact *P. haemolytica* and recombinant *E. coli* expressing PlpE are capable of absorbing anti-PlpE antibodies from bovine immune serum, indicating that PlpE is surface exposed in *P. haemolytica* and assumes a similar surface-exposed conformation in *E. coli*. In complement-mediated killing assays, we observed a significant reduction in killing of *P. haemolytica* when bovine immune serum that was depleted of anti-PlpE antibodies was used as the source of antibody. Our data suggest that PlpE is surface exposed and immunogenic in cattle and that antibodies against PlpE contribute to host defense against *P. haemolytica*.

REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L13 ANSWER 7 OF 13 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN

ACCESSION NUMBER: 1997:282228 BIOSIS
DOCUMENT NUMBER: PREV199799581431
TITLE: Cloning and sequence analysis of PomA encoding a major immunogenic outer membrane protein of *Pasteurella haemolytica*.
AUTHOR(S): Zeng, H.; Murphy, G. L.; Pandher, K.
CORPORATE SOURCE: Okla. State Univ., Stillwater, OK, USA
SOURCE: Abstracts of the General Meeting of the American Society for Microbiology, (1997) Vol. 97, No. 0, pp. 113.
Meeting Info.: 97th General Meeting of the American Society for Microbiology. Miami Beach, Florida, USA. May 4-8, 1997.

ISSN: 1060-2011.
 DOCUMENT TYPE: Conference; (Meeting)
 Conference; Abstract; (Meeting Abstract)
 Conference; (Meeting Poster)
 LANGUAGE: English
 ENTRY DATE: Entered STN: 3 Jul 1997
 Last Updated on STN: 3 Jul 1997

L13 ANSWER 8 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 6

ACCESSION NUMBER: 1996:587085 CAPLUS
 DOCUMENT NUMBER: 125:242557
 TITLE: Genetic and immunological analyses of a 38 kDa
 surface-exposed lipoprotein of *Pasteurella*
haemolytica A1
 AUTHOR(S): Pandher, Karamjeet; Murphy, George
 L.
 CORPORATE SOURCE: College Veterinary Medicine, Oklahoma State
 University, Stillwater, OK, 74078-2007, USA
 SOURCE: Veterinary Microbiology (1996), 51(3-4), 331-341
 CODEN: VMICDQ; ISSN: 0378-1135
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB *Pasteurella haemolytica* serotype A1 is the bacterial pathogen most frequently isolated from the lungs of cattle with bovine respiratory disease. As part of a study to characterize *P. haemolytica* antigens which are important in eliciting resistance to **pneumonic pasteurellosis**, the authors have cloned and sequenced the gene encoding a 38 kDa lipoprotein, Lpp38. The deduced amino acid sequence of Lpp38 is similar to those of the *Escherichia coli* polyamine transport proteins PotD (70%) and PotF (33%). *P. haemolytica* Lpp38 is present in both inner membrane and **outer membrane** fractions of the cell envelope. Susceptibility of Lpp38 to cleavage by extracellular proteases indicates that portions of the protein are surface-exposed. A protein of similar mol. mass in *P. haemolytica* strains from all 12 serotypes of biotype A and in an untypeable strain was detected by an anti-Lpp38 monoclonal antibody. Lpp38 is recognized by sera from calves resistant to infection after natural exposure to *P. haemolytica* and by sera from calves protected against infection by vaccination with *P. haemolytica* A1 **outer membranes** or with live bacteria. These data suggest a role for this protein in the development of immunity to *P. haemolytica* infection.

L13 ANSWER 9 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 7

ACCESSION NUMBER: 1995:770995 CAPLUS
 DOCUMENT NUMBER: 123:254294
 TITLE: Serum antibody responses of cattle to iron-regulated
outer membrane proteins of
Pasteurella haemolytica A1
 AUTHOR(S): Confer, Anthony W.; McCraw, Robert D.;
 Durham, Janet A.; Morton, Rebecca J.; Panciera, Roger
 J.
 CORPORATE SOURCE: Department of Veterinary Pathology, Oklahoma State
 University, Stillwater, OK, 74078, USA
 SOURCE: Veterinary Immunology and Immunopathology (1995),
 47(1,2), 101-10
 CODEN: VIIMDS; ISSN: 0165-2427
 PUBLISHER: Elsevier
 DOCUMENT TYPE: Journal
 LANGUAGE: English

AB Serum antibody responses to the 70, 77, and 100 kDa iron-regulated **outer membrane** proteins (IROMPs) of *P. haemolytica* A1 were studied in cattle vaccinated with **outer membrane** protein (OMP) enriched **outer membrane** fraction, IROMP-enriched **outer**

membrane fraction, or live *P. haemolytica*. Vaccination with an IROMP-enriched outer membrane fraction stimulated antibodies to the 70 kDa IROMP, whereas vaccination with live *P. haemolytica* stimulated antibodies to the 70 and 77 kDa IROMPs. In a second experiment, sera were used from cattle vaccinated with live or killed *P. haemolytica* and subsequently challenged. Antibody responses to OMP- and IROMP-enriched outer membrane fractions were detected by an ELISA for cattle vaccinated with bacterins or live *P. haemolytica*. Regression anal. indicated correlations between high antibody responses to the OMP - or IROMP-enriched fraction and resistance to challenge. Antibody responses to the 70 and 77 kDa IROMPs were greater for the live *P. haemolytica* vaccinates than for PBS control vaccinates. There was no correlation between antibody responses to individual IROMPs and resistance or susceptibility to challenge. Thus, antibodies to IROMPs alone are probably not responsible for protective immunity against **pneumonic pasteurellosis**. Antibodies to IROMPs, however, in conjunction with antibodies to other surface antigens probably enhance immunity to *P. haemolytica* challenge.

L13 ANSWER 10 OF 13 MEDLINE on STN DUPLICATE 8
 ACCESSION NUMBER: 94160510 MEDLINE
 DOCUMENT NUMBER: PubMed ID: 8116191
 TITLE: Immunogens of Pasteurella.
 AUTHOR: Confer A W
 CORPORATE SOURCE: Department of Veterinary Pathology, College of Veterinary Medicine, Oklahoma State University, Stillwater 74078.
 SOURCE: Veterinary microbiology, (1993 Nov) 37 (3-4) 353-68. Ref: 78
 Journal code: 7705469. ISSN: 0378-1135.
 PUB. COUNTRY: Netherlands
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
 General Review; (REVIEW)
 (REVIEW, TUTORIAL)
 LANGUAGE: English
 FILE SEGMENT: Priority Journals
 ENTRY MONTH: 199403
 ENTRY DATE: Entered STN: 19940406
 Last Updated on STN: 19940406
 Entered Medline: 19940331

AB The family Pasteurellaceae Pohl contains Gram-negative, facultatively anaerobic and fermentative bacteria of the genera Pasteurella, Haemophilus, and Actinobacillus. Approximately 20 different species of the genus Pasteurella have been identified using phenotypic and genetic analyses. Of these species, *P. multocida* and *P. haemolytica* are the most prominent pathogens in domestic animals causing severe diseases and major economic losses in the cattle, swine, sheep, and poultry industries. Mechanisms of immunity to these bacteria have been difficult to determine, and efficacious vaccines have been a challenge to develop and evaluate. Pasteurella multocida of serogroups A and D are mainly responsible for disease in North American poultry and pigs and to a lesser extent in cattle. Fowl cholera in chickens and turkeys is caused by various serotypes of *P. multocida* serogroup A and characterized by acute septicemia and fibrinous pneumonia or chronic fibrinopurulent inflammation of various tissues. Current biologicals in use are live *P. multocida* vaccines and bacterins. Potency tests for avian *P. multocida* biologicals are a bacterial colony count for vaccines and vaccination and challenge of birds for bacterins. Somatic antigens, particularly lipopolysaccharide (LPS), appear to be of major importance in immunity. In North American cattle, *P. multocida* serogroup A is associated mainly with bronchopneumonia (enzootic pneumonia) in young calves; however, it is occasionally isolated from fibrinous pleuropneumonia of feedlot cattle (**shipping fever**). Biologicals currently available are modified-live vaccines and bacterins. The potency test for vaccines is bacterial colony counts. The test for bacterin potency is vaccination and challenge of mice. Important immunogens have not been well characterized

for *P. multocida* infection in cattle. In swine, *P. multocida* infection is sometimes associated with pneumonia; however, its major importance is in atrophic rhinitis. A protein toxin (dermonecrotic toxin), produced by toxigenic strains of *P. multocida* types A and D, and concurrent infection with *Bordetella bronchiseptica* appear to be the major factors in development of atrophic rhinitis. Currently available biologicals are bacterins and inactivated toxins (toxoids). The toxin appears to be the major immunogen for preventing atrophic rhinitis. There are, however, no standardized requirements for potency testing of *P. multocida* type D toxoid. Various serotypes of *P. haemolytica* biotype A are responsible for severe fibrinous pleuropneumonia of cattle and sheep, occasionally septicemia of lambs, and mastitis in ewes. Several serotypes of *P. haemolytica* biotype T are isolated from acute septicemia of lambs. The currently available *P. haemolytica* biologicals are modified-live vaccines, bacterins, bacterial surface extracts, and culture supernates that contain an exotoxin (leukotoxin). (ABSTRACT TRUNCATED AT 400 WORDS)

L13 ANSWER 11 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 9

ACCESSION NUMBER: 1993:596934 CAPLUS

DOCUMENT NUMBER: 119:196934

TITLE: Analysis of tandem, multiple genes encoding 30-kDa membrane proteins in *Pasteurella haemolytica* A1

AUTHOR(S): Murphy, George L.; Whitworth, Lisa C.

CORPORATE SOURCE: Dep. Vet. Pathol., Oklahoma State Univ., Stillwater, OK, 74078, USA

SOURCE: Gene (1993), 129(1), 107-11
CODEN: GENED6; ISSN: 0378-1119

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A number of **outer membrane** proteins (OMPs), including a 30-kDa protein, may be important in eliciting immunity to *Pasteurella hemolytica* A1, the causative agent of bovine **pneumonic pasteurellosis**. To better understand the nature of the 30-kDa antigen, several genes encoding this protein were sequenced. Sequence anal. revealed that three sep. genes encoding similar, yet distinct, versions of the 30-kDa protein are tandemly arranged on the *P. hemolytica* A1 chromosome. The genes appear to be transcribed from a single promoter. The deduced amino acid sequences of the proteins encoded by these genes are similar to a 28-kDa inner membrane lipoprotein of *Escherichia coli* and a 28-kDa membrane protein which may contribute to the virulence of *Haemophilus influenzae* type b strains.

L13 ANSWER 12 OF 13 MEDLINE on STN

ACCESSION NUMBER: 92328311 MEDLINE

DOCUMENT NUMBER: PubMed ID: 1378250

TITLE: Comparison of antibody responses in cattle to **outer membrane** proteins from *Pasteurella haemolytica* serotype 1 and from eight untypeable strains.

AUTHOR: Simons K R; Morton R J; Fulton R W; Confer A W

CORPORATE SOURCE: Department of Veterinary Parasitology, College of Veterinary Medicine, Oklahoma State University, Stilwater 74078.

SOURCE: American journal of veterinary research, (1992 Jun) 53 (6) 971-5.

Journal code: 0375011. ISSN: 0002-9645.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 199208

ENTRY DATE: Entered STN: 19920821

Last Updated on STN: 19970203

Entered Medline: 19920807

AB Membrane associated proteins from 8 untypeable *Pasteurella haemolytica* strains were separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and compared with those of *P. haemolytica* serotypes 1 and 2. Cattle antisera obtained from *P. haemolytica* serotype 1 vaccine trials were used in immunoblotting assays to compare the membrane proteins from the 8 untypeable strains with those from *P. haemolytica* serotypes 1 and 2. Densitometry was used to identify bands, and using linear regression analyses, the peak area optical densities (measuring antibody response) were correlated to lesion scores from the vaccinated calves. Significant antibody responses to proteins of 99, 69, 60, 55, 47, 45, 39, 33, 30, 16, and 14.5 kDa were detected for 4 or more of the 8 *P. haemolytica* untypeable strains. Serotypes 1 and 2 of *P. haemolytica* contained a comigrating 30-kDa protein. Antibody responses to proteins of 39, 33, and 32.5 kDa were significant for 3 of the untypeable strains and had significant correlation to lesion scores. Antibody responses to various other proteins were significant for 2 untypeable strains each.

L13 ANSWER 13 OF 13 MEDLINE on STN DUPLICATE 10
 ACCESSION NUMBER: 91263344 MEDLINE
 DOCUMENT NUMBER: PubMed ID: 2048283
 TITLE: Cloning and expression of a 30 kDa surface antigen of *Pasteurella haemolytica*.
 AUTHOR: Craven R C; Confer A W; Gentry M J
 CORPORATE SOURCE: Department of Botany and Microbiology, College of Veterinary Medicine, Oklahoma State University, Stillwater 14078.
 SOURCE: Veterinary microbiology, (1991 Mar) 27 (1) 63-78.
 Journal code: 7705469. ISSN: 0378-1135.
 PUB. COUNTRY: Netherlands
 DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)
 LANGUAGE: English
 FILE SEGMENT: Priority Journals
 ENTRY MONTH: 199107
 ENTRY DATE: Entered STN: 19910802
 Last Updated on STN: 19970203
 Entered Medline: 19910718

AB *Pasteurella haemolytica* biotype A serotype 1 is the principal etiologic agent of bovine **pneumonic pasteurellosis**. A clear understanding of the pathogenesis of this disease and the mechanisms of resistance to it has been limited by a lack of information on the important antigens of the organisms. Using recombinant DNA techniques we have cloned a segment of DNA from *P. haemolytica* A1 that encodes three proteins of 28, 30, and 32 kDa. Two of these proteins, 30 and 28 kDa, react strongly on a Western blot with a bovine serum raised against live cells of *P. haemolytica* A1. The gene for the 30 kDa protein was localized to a 3.1 kbp EcoRI fragment, and expression of the 30 kDa protein was found to be independent of an *E. coli* promoter. The 30 kDa protein comigrated with a 30 kDa *P. haemolytica* protein that was susceptible to radioiodination and presumably exposed on the bacterial cell surface. The other principal radiolabeled *P. haemolytica* proteins were 100, 45, and 15 kDa. Antibodies against the 30 kDa protein, isolated from *E. coli* carrying the recombinant plasmid, recognized 30 kDa and 15 kDa proteins in *P. haemolytica* serotypes 1-15 and caused agglutination of whole *P. haemolytica* A1 cells. Cattle vaccinated with live *P. haemolytica*, *P. haemolytica* outer membrane proteins, or the cloned 30 kDa protein developed antibodies to the cloned 30 kDa protein as detected by Western blotting and densitometry. Sera were obtained from cattle vaccinated with live or killed *P. haemolytica* or saline and challenged with *P. haemolytica*. Those sera were evaluated for antibody responses to the cloned 30 kDa protein. High antibody responses to the 30 kDa protein significantly correlated (*P* less than 0.01) with resistance to challenge. From these studies it is concluded that the 30 kDa protein represents a surface antigen of *P. haemolytica* A1 that may be important in inducing immunity to *P. haemolytica*.

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Set	Items	Description
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S2	17	AU=(AYALEW S? OR AYALEW, S?)
S3	3088	AU=(MURPHY, G? OR MURPHY G?)
S4	20	AU=(PANDHER, K? OR PANDHER K?)
S5	2	S1 AND S2 AND S3 AND S4
S6	22	S1 AND (S2 OR S3 OR S4)
S7	2	S2 AND (S3 OR S4)
S8	12	S3 AND S4
S9	107	(S1 OR S2 OR S3 OR S4) AND HAEMOLYTIC?
S10	39	S9 AND (OMP? ? OR OUTER(W)MEMBRAN?)
S11	47	S5 OR S6 OR S7 OR S8 OR S10
S12	26	RD (unique items)

>>>No matching display code(s) found in file(s): 65, 113

12/3,AB/1 (Item 1 from file: 65)
DIALOG(R)File 65:Inside Conferences
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01166866 INSIDE CONFERENCE ITEM ID: CN011443369
Pathogenesis and Virulence of Pasteurella haemolytica in Cattle: An
Analysis of Current Knowledge and Future Approaches

Confer, A. W.; Clinkenbeard, K. D.; **Murphy, G. L.**

CONFERENCE: Haemophilus, actinobacillus, and pasteurella-3rd
International conference

HAEMOPHILUS ACTINOBACILLUS AND PASTEURILLA, 1994; 3rd P: 51-62

N.Y., Plenum Pr., 1995

ISBN: 0306451042

LANGUAGE: English DOCUMENT TYPE: Conference Papers

CONFERENCE EDITOR(S): Donachie, W.; Lainson, F. A.; Hodgson, J. C.

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viii, 245p.

12/3,AB/2 (Item 1 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 2004 Inst for Sci Info. All rts. reserv.

17921667 Document Delivery Available: 000189087300015 References: 29
TITLE: Maternally derived humoral immunity to bovine viral diarrhea virus
(BVDV) 1a, BVDV1b, BVDV2, bovine herpesvirus-1, parainfluenza-3 virus
bovine respiratory syncytial virus, Mannheimia haemolytica and
Pasteurella multocida in beef calves, antibody decline by half-life
studies and effect on response to vaccination

AUTHOR(S): Fulton RW (REPRINT); Briggs RE; Payton ME; **Confer AW**;

Saliki JT; Ridpath JF; Burge LJ; Duff GC

AUTHOR(S) E-MAIL: rfulton@okstate.edu

Searched by : Shears 272-2528

CORPORATE SOURCE: Oklahoma State Univ, Coll Vet Med, /Stillwater//OK/74078
 (REPRINT); Oklahoma State Univ, Coll Vet Med, /Stillwater//OK/74078;
 Oklahoma State Univ, Oklahoma Anim Dis Diagnost Lab,
 /Stillwater//OK/74078; Oklahoma State Univ, Coll Vet Med,
 /Stillwater//OK/74078; Oklahoma State Univ, Dept Stat,
 /Stillwater//OK/74078; USDA ARS, Natl Anim Dis Ctr, /Ames//IA/50010; Univ
 Arizona, Dept Anim Sci, /Tucson//AZ/

PUBLICATION TYPE: JOURNAL

PUBLICATION: VACCINE, 2004, V22, N5-6 (JAN 26), P643-649

GENUINE ARTICLE#: 775YB

PUBLISHER: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON,
 OXFORD OX5 1GB, OXON, ENGLAND

ISSN: 0264-410X

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The passive immunity transferred to calves from their dams was investigated in a beef herd to determine half-life of antibody, estimated time to seronegative status and effect on immunization. One hundred two beef calves in a commercial ranch under standard management conditions were utilized. Samples were collected at branding (day 0). This was the first possible date to collect samples postcalving. This was approximately 2 months postcalving, and days 95 and 116. The calves were divided into two groups: vaccinates (51) and nonvaccinates (51). The calves were vaccinated with a commercial inactivated viral vaccine containing bovine viral diarrhea virus (BVDV)1a, BVDV2, bovine herpesvirus-1 (BHV-1), parainfluenza-3 virus (PI-3V), and bovine respiratory syncytial virus (BRSV) on days 0 and 95. Half of the vaccinated and unvaccinated calves also received one dose of an experimental Mannheimia *haemolytica* and Pasteurella multocida vaccine at day 95. Serums were tested for neutralizing antibody titers to BVDV1a, BVDV1b, BVDV2, BHV-1, PI-3V, and BRSV. Antibodies were detected by ELISA to M. *haemolytica* whole cell, M. *haemolytica* leukotoxin, and P. multocida **outer membrane protein (OMP)**. The mean half-life of viral antibodies in nonvaccinated calves to each virus was: BVDV1a, 23.1 days (d); BVDV1b, 22.8 d; BVDV2, 22.9 d; BHV-1, 21.2d; PI-3V, 30.3 d; and BRSV, 35.9d. The mean half-life of viral antibodies was greater for vaccinates than for nonvaccinates for all viruses except BRSV. The calculated mean time to seronegative status for nonvaccinates based on titers at day 0 was: BVDV1a, 192.2 d; BVDV1b, 179.1 d; BVDV2, 157.8 d; BHV-1, 122.9 d; PI-3V, 190.6 d; and BRSV, 186.7 d. There was an active immune response after vaccination with two doses to all the viruses, except BRSV. Mean antibody titers of vaccinates at day 116 were statistically higher than nonvaccinates for all viruses except BRSV. However on an individual calf basis there were few seroconversions (four-fold rise or greater to BVDV 1a, BVDV1b, BVDV2, PI-3V, or BRSV; or two-fold rise for BHV-1) in the presence of viral antibodies. The predicted time of seronegative status for a group of calves for vaccination programs may not be appropriate as there may be a range of titers for all calves at day 0. In this study the range for BVDV1a was 16-16,384; BVDV1b, 8-8192; BVDV2, 0-8192; BHV-1, 0-935; PI-3V, 8-2048; and BRSV, 8-4096. Using the half-life of 23 d for BVDV 1a, the time thereafter for seronegative status would be 46 and 299 d compared to the calculated date of 192.2 d using the mean of estimated time to seronegative status for all the calves. There was an active humoral response in the vaccinated calves to M. *haemolytica* and P. multocida. Cowherd Immoral immunity based on serum antibodies should be monitored as it may relate to transfer of maternal antibodies to calves. Exceptionally high levels of viral antibodies transferred to calves could interfere with the antibody response to vaccination. Published by Elsevier Ltd.

12/3,AB/3 (Item 2 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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16460392 Document Delivery Available: 000183709300020 References: 25
 TITLE: Immunogenicity of recombinant Mannheimia *haemolytica* serotype

1 **outer membrane** protein PlpE and augmentation of a commercial vaccine

AUTHOR(S): Confer AW (REPRINT); Ayalew S; Panciera RJ;
Montelongo M; Whitworth LC; Hammer JD
AUTHOR(S) E-MAIL: aconfer@okstate.edu
CORPORATE SOURCE: Oklahoma State Univ, Dept Vet Pathobiol, 250 McElroy
Hall/Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept Vet
Pathobiol, /Stillwater//OK/74078
PUBLICATION TYPE: JOURNAL
PUBLICATION: VACCINE, 2003, V21, N21-22 (JUN 20), P2821-2829
GENUINE ARTICLE#: 693GT
PUBLISHER: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON,
OXFORD OX5 1GB, OXON, ENGLAND
ISSN: 0264-410X
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Mannheimia **haemolytica** is the major cause of severe bacterial pneumonia associated with shipping fever in cattle. The gene for M. **haemolytica** **outer membrane** protein (OMP) PlpE was cloned into the expression vector pRSETA. The cloned gene was then expressed in BL21(DE3)pLysS and the recombinant PlpE (rPlpE) was purified and used in immunological and vaccination studies. Vaccination of cattle with commercial M. **haemolytica** vaccines stimulated no significant ($P > 0.05$) antibody responses to rPlpE. Recombinant PlpE in a commercial proprietary adjuvant was highly immunogenic when injected subcutaneously into cattle. Vaccination of cattle with 100 μ g of rPlpE markedly enhanced resistance against experimental challenge with virulent M. **haemolytica**. Addition of 100 μ g of rPlpE to a commercial M. **haemolytica** vaccine, Presponse(R) significantly enhanced ($P < 0.05$) protection afforded by the vaccine against experimental challenge. Addition of rPlpE to commercial M. **haemolytica** vaccines could greatly enhance vaccine efficacy. (C) 2003 Elsevier Science Ltd. All rights reserved.

12/3,AB/4 (Item 3 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 2004 Inst for Sci Info. All rts. reserv.

14222367 Document Delivery Available: 000176474200004 References: 45
TITLE: Characterization of, and immune responses of mice to, the purified OmpA-equivalent **outer membrane** protein of Pasteurella multocida serotype A : 3 (Omp28)
AUTHOR(S): Gatto NT; Dabo SM; Hancock RE; Confer AW (REPRINT)
AUTHOR(S) E-MAIL: aconfer@okstate.edu
CORPORATE SOURCE: Oklahoma State Univ, Dept Vet Pathobiol, 250 McElroy
Hall/Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept Vet
Pathobiol, /Stillwater//OK/74078; Univ British Columbia, Dept Microbiol &
Immunol, /Vancouver/BC V6T 1Z3/Canada/
PUBLICATION TYPE: JOURNAL
PUBLICATION: VETERINARY MICROBIOLOGY, 2002, V87, N3 (JUL 9), P221-235
GENUINE ARTICLE#: 567FF
PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
ISSN: 0378-1135
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Pasteurella multocida A:3 is a major cause of bovine pneumonia. A major antigenic heat-modifiable 28 kDa **outer membrane** protein (Omp28) was previously identified. The purpose of this study was to purify and characterize Omp28 immunologically and structurally. Omp28 was extracted from N-lauroylsarcosine-insoluble protein preparations by a combination of detergent fractionation with Zwittergent 3-14 and chromatography. Partial N-terminal amino acid sequence confirmed Omp28 as a member of the OmpA-porin family. However, porin activity could not be demonstrated in a lipid-bilayer assay. Heat modifiability of purified Omp28 was demonstrated, and Omp28 was found in **outer membrane** fraction of P. multocida. Surface exposure of Omp28 was demonstrated by

partial protease digestion of intact bacteria, by binding of anti-Omp28 polyclonal ascites fluid to the bacterial surface, and by partial inhibition of anti-**outer membrane** antiserum binding by previous incubation of the bacteria with anti-Omp28 serum. CD-1 mice vaccinated with purified Omp28 developed a significant antibody titer ($P < 0.05$) compared to the control treatment group but were not protected from a homologous intraperitoneal bacterial challenge. By contrast, treatment groups vaccinated with R multocida **outer membrane**, formalin-killed P. multocida or a commercial vaccine were significantly protected from challenge. In vitro complement-mediated killing of R multocida was observed in post-vaccination sera of **outer membrane**, formalin-killed P. multocida, and commercial vaccine-treatment groups, but not with sera from the Omp28-treatment group. In conclusion, although Omp28 is surface exposed and antigenic, it may not be a desirable immunogen for stimulating immunity to P. multocida. (C) 2002 Elsevier Science B.V. All rights reserved.

12/3,AB/5 (Item 4 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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12653723 References: 42

TITLE: Intranasal vaccination of rabbits with Pasteurella multocida A : 3 **outer membranes** that express iron-regulated proteins

AUTHOR(S): Confer AW (REPRINT); Suckow MA; Montelongo M; Dabo SM; Miloscio LJ; Gillespie AJ; Meredith GL

CORPORATE SOURCE: Oklahoma State Univ, Dept Vet Pathobiol, /Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept Vet Pathobiol, /Stillwater//OK/74078; Purdue Univ, Lab Anim Program, /W Lafayette//IN/47907

PUBLICATION TYPE: JOURNAL

PUBLICATION: AMERICAN JOURNAL OF VETERINARY RESEARCH, 2001, V62, N5 (MAY), P697-703

GENUINE ARTICLE#: 426QE

PUBLISHER: AMER VETERINARY MEDICAL ASSOC, 1931 N MEACHAM RD SUITE 100, SCHAUMBURG, IL 60173-4360 USA

ISSN: 0002-9645

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Objective-To determine efficacy of intranasal vaccination of rabbits with Pasteurella multocida A:3 **outer membrane** proteins (OMP) expressing iron-regulated OMP (IROMP) in conferring protection against experimental challenge exposure.

Animals-52 male New Zealand White rabbits.

Procedure-Rabbits were vaccinated intranasally on days 0, 7, and 14; some vaccines included cholera toxin (CT) as an adjuvant. Concentrations of intranasal IgA and serum IgG antibodies against P multocida OMP were determined. In experiment A, rabbits were vaccinated with either phosphate-buffered saline solution (PBSS), PBSS-CT, OMP-CT, or IROMP-CT, challenge-exposed intranasally on day 16, and euthanatized and necropsied on day 28. Rabbits were also vaccinated with OMP or IROMP without CT and were not challenge-exposed. In experiment B, rabbits were vaccinated with PBSS, PBSS-CT, IROMP, or IROMP-CT. On day 17, rabbits were challenge-exposed intranasally. Nasal bacteria and antibodies were determined on day 24.

Results-In experiment A, OM P-CT vaccination stimulated mucosal and systemic antibody responses to the bacterium and enhanced resistance against challenge exposure. Intranasal bacterial counts were not significantly reduced. Vaccination with IROMP-CT stimulated mucosal and systemic antibodies, enhanced resistance to challenge exposure, and significantly reduced nasal bacterial counts. In experiment B, natural infection was detected in several rabbits at challenge exposure; however, IROMP-CT-vaccinated rabbits had significantly higher serum and nasal

antibody responses, compared with other rabbits IROMP-CT-vaccinated rabbits had significantly lower nasal bacterial counts compared to control rabbits.

Conclusions and Clinical Relevance-Intranasal vaccination of rabbits with *P. multocida* **outer membranes** containing IROMP and CT stimulated immunity against experimental pneumonic pasteurellosis.

12/3,AB/6 (Item 5 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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11062886 References: 52

TITLE: Characterization of rabbit *Pasteurella multocida* isolates by use of whole-cell, **outer-membrane**, and polymerase chain reaction typing

AUTHOR(S): Dabo SM (REPRINT); Confer AW; Montelongo M; Lu YS
CORPORATE SOURCE: Oklahoma State Univ, Dept Anat Pathol & Pharmacol, 250 Vet Med Bldg/Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept Anat Pathol & Pharmacol, /Stillwater//OK/74078; Univ Texas, Dept Pathol, /Dallas//TX/75230

PUBLICATION TYPE: JOURNAL

PUBLICATION: LABORATORY ANIMAL SCIENCE, 1999, V49, N5 (OCT), P551-559

GENUINE ARTICLE#: 250NE

PUBLISHER: AMER ASSOC LABORATORY ANIMAL SCIENCE, 9190 CRESTWYN HILLS DR, MEMPHIS, TN 38125 USA

ISSN: 0023-6764

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Purpose: To characterize *Pasteurella multocida* isolates from laboratory rabbits using serotyping, sodium dodecyl sulfate-polyacrylamide gel electrophoresis of whole-cell proteins (WCPs) and **outer-membrane** proteins (OMPs), and polymerase chain reaction (PCR) fingerprinting,

Methods: Fifty isolates were obtained from five sources: ATCC (1), Oklahoma (4), Michigan (9), Minnesota (7), and Texas (29). The PCR fingerprinting was conducted using two minisatellite probes for M13 and a modified M13 core sequence and two microsatellite probes-(GTG) (5) and (GACA) (4).

Results: Forty five isolates were serogroup A, and five were serogroup D. Ten WCP patterns (W1-W10) with one variation (W1a) and 10 GRIP (OM1-OM10) patterns were found. Primers M13 phage, modified M13 phage, (GTG),, and (GACA), generated 7, 9, 5, and 9 fingerprint types, respectively. Combination of WCP, **OMP** and PCR fingerprint results yielded 39 groups with a discrimination index of 0.98. The PCR fingerprint results generally indicated clonal association among isolates within geographic locations except for the isolates from Texas, which varied markedly in PCR fingerprint types.

Conclusion: Single primer PCR fingerprinting provided a simple and rapid means of typing *P. multocida* isolates from laboratory rabbits. Combinations of conventional and molecular typing enhanced differentiation among *P. multocida* isolated from rabbits with pasteurellosis.

12/3,AB/7 (Item 6 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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10844032 References: 38

TITLE: Molecular cloning of the *Pasteurella haemolytica* *pomA* gene and identification of bovine antibodies against *PomA* surface domains

AUTHOR(S): Zeng H; Pandher K; Murphy GL (REPRINT)

AUTHOR(S) E-MAIL: gmurphy@ambion.com

CORPORATE SOURCE: Ambion Inc, 2130 Woodward St/Austin//TX/78744 (REPRINT);
 Oklahoma State Univ, Dept Anat Pathol & Pharmacol, /Stillwater//OK/74078
 PUBLICATION TYPE: JOURNAL
 PUBLICATION: INFECTION AND IMMUNITY, 1999, V67, N9 (SEP), P4968-4973
 GENUINE ARTICLE#: 228LU
 PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,
 WASHINGTON, DC 20005-4171 USA
 ISSN: 0019-9567
 LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The gene (pomA) encoding PomA, an **OmpA**-like major outer membrane protein of the bovine respiratory pathogen *Pasteurella haemolytica*, was cloned, and its nucleotide sequence was determined. The deduced amino acid sequence of PomA has significant identity with the sequences of other **OmpA** family proteins. Absorption of three different bovine immune sera with whole *P. haemolytica* cells resulted in a reduction of bovine immunoglobulin G reactivity with recombinant PomA in Western immunoblots, suggesting the presence of antibodies against PomA surface domains.

12/3,AB/8 (Item 7 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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10373025 References: 34
 TITLE: Identification of immunogenic, surface-exposed outer membrane proteins of *Pasteurella haemolytica* serotype 1
 AUTHOR(S): Pandher K; Murphy GL (REPRINT); Confer AW
 AUTHOR(S) E-MAIL: gmurphy@okway.okstate.edu
 CORPORATE SOURCE: Oklahoma State Univ, Dept Anat Pathol & Pharmacol, 209 Vet Med Bldg/Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept Anat Pathol & Pharmacol, /Stillwater//OK/74078
 PUBLICATION TYPE: JOURNAL
 PUBLICATION: VETERINARY MICROBIOLOGY, 1999, V65, N3 (MAR 12), P215-226
 GENUINE ARTICLE#: 174CT
 PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
 ISSN: 0378-1135
 LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: *Pasteurella haemolytica* serotype 1 (S1) is the bacterium most frequently recovered from the lungs of cattle that have succumbed to shipping fever pneumonia. *P. haemolytica* outer membrane proteins (OMPs) are important immunogens in the development of resistance to pneumonic pasteurellosis. The purpose of this study was to identify the repertoire of immunogenic, surface-exposed *P. haemolytica* (S1) OMPs, that could be important in the development of protective immunity. We determined surface exposure of OMPs by (1) their susceptibility to protease treatment and (2) their ability to adsorb out antibodies from bovine immune sera. For a comprehensive identification of immunogenic, surface-exposed OMPs, we used bovine antisera from calves that were resistant to experimental *P. haemolytica* challenge after (1) natural exposure to *P. haemolytica*, (2) vaccination with live *P. haemolytica*, or (3) vaccination with *P. haemolytica* OMPs. We identified 21 immunogenic, surface-exposed *P. haemolytica* OMPs. Most were recognized by all three immune sera. However, some were recognized by one or two of the three antisera. Our analyses identified surface-exposed, immunogenic proteins that were not identified in previous studies. (C) 1999 Elsevier Science B.V. All rights reserved.

12/3,AB/9 (Item 8 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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10064268 References: 49

TITLE: Genetic and immunologic analyses of PlpE, a lipoprotein important in complement-mediated killing of *Pasteurella haemolytica* serotype 1

AUTHOR(S): **Pandher K; Confer AW; Murphy GL (REPRINT)**

AUTHOR(S) E-MAIL: gmurphy@okway.okstate.edu

CORPORATE SOURCE: Oklahoma State Univ, Dept APP, 209 Vet Med

Bldg/Stillwater//OK/74078 (REPRINT); Oklahoma State Univ, Dept APP,

/Stillwater//OK/74078

PUBLICATION TYPE: JOURNAL

PUBLICATION: INFECTION AND IMMUNITY, 1998, V66, N12 (DEC), P5613-5619

GENUINE ARTICLE#: 142BG

PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,

WASHINGTON, DC 20005-4171 USA

ISSN: 0019-9567

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: *Pasteurella haemolytica* serotype 1 is the bacterium most commonly associated with bovine shipping fever. The presence of antibodies against P, *haemolytica* outer membrane proteins (OMPs) correlates statistically with resistance to experimental P, *haemolytica* challenge in cattle. Until now, specific P. *haemolytica* OMPs which elicit antibodies that function in host defense mechanisms have not been identified. In this study, we have cloned and sequenced the gene encoding one such protein, PlpE. Analysis of the deduced amino acid sequence revealed that PlpE is a lipoprotein and that it is similar to an *Actinobacillus pleuropneumoniae* lipoprotein, OmlA. Affinity-purified, anti-PlpE antibodies recognize a protein in all serotypes of P. *haemolytica* except serotype 11. We found that intact P. *haemolytica* and recombinant *E. coli* expressing PlpE are capable of absorbing anti-PlpE antibodies from bovine immune serum, indicating that PlpE is surface exposed in P. *haemolytica* and assumes a similar surface-exposed conformation in *E. coli*. In complement-mediated killing assays, we observed a significant reduction in killing of P. *haemolytica* when bovine immune serum that was depleted of anti-PlpE antibodies was used as the source of antibody. Our data suggest that PlpE is surface exposed and immunogenic in cattle and that antibodies against PlpE contribute to host defense against P. *haemolytica*.

12/3,AB/10 (Item 9 from file: 440)

DIALOG(R)File 440:Current Contents Search(R)

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09990451 References: 27

TITLE: Characterization of a *Pasteurella haemolytica* A1 mutant deficient in production of three membrane lipoproteins

AUTHOR(S): **Murphy GL (REPRINT); Whitworth LC; Confer AW;**

Gaskins JD; **Pandher K; Dabo SM**

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL &

PHARMACOL/STILLWATER//OK/74078 (REPRINT)

PUBLICATION TYPE: JOURNAL

PUBLICATION: AMERICAN JOURNAL OF VETERINARY RESEARCH, 1998, V59, N10 (OCT), P1275-1280

GENUINE ARTICLE#: 135QR

PUBLISHER: AMER VETERINARY MEDICAL ASSOC, 1931 N MEACHAM RD SUITE 100,

SCHAUMBURG, IL 60173-4360

ISSN: 0002-9645

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Objective-To determine whether a *Pasteurella haemolytica* A1 mutant that is unable to produce membrane lipoproteins has reduced susceptibility to complement-mediated killing, and to characterize the mutant strain.

Sample Population-12 sera from cattle resistant to P *haemolytica* challenge exposure after vaccination with P *haemolytica* or its antigens, or after natural exposure.

Procedures-Complement-mediated killing assays were performed, using wild-type and mutant strains and, as antibody source, various immune sera from cattle that were resistant to *P haemolytica* challenge exposure. Antibody response to whole-cell antigens produced by mutant and wild-type strains, production of **outer membrane** proteins and iron-regulated **outer membrane** proteins by the 2 strains, and growth of the 2 strains in various media were analyzed.

Results-Compared with wild-type *P haemolytica*, the lipoprotein mutant strain had increased susceptibility to bovine complement-mediated killing. Aside from the lipoproteins that are not produced by the mutant, immunoblot analysis did not reveal differences between immunoreactive antigens that are produced by the 2 strains. Some iron-regulated, **outer membrane** proteins, which usually are only produced by *P haemolytica* under iron-deficient conditions, were produced constitutively by the mutant. The mutant grew to a lower final cell density and at a lower rate under conditions likely to reflect those encountered in vivo.

Conclusions-Lack of 3 membrane lipoproteins resulted in enhanced susceptibility to bovine complement-mediated killing. Site-specific mutagenesis of genes encoding *P haemolytica* membrane lipoproteins alters production of iron-regulated **outer membrane** proteins by *P haemolytica*. Growth characteristics of the mutant suggested that it may have reduced capacity for survival in vivo.

12/3,AB/11 (Item 10 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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08797402 References: 28

TITLE: Serum antibody responses of cattle vaccinated with partially purified native *Pasteurella haemolytica* leukotoxin

AUTHOR(S): **Confer AW (REPRINT)**; Clinkenbeard KD; Gatewood DM; Driskel BA; Montelongo M

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL & PHARMACOL/STILLWATER//OK/74078 (REPRINT); DIAMOND ANIM HLTH,/DES MOINES//IA/50317

PUBLICATION TYPE: JOURNAL

PUBLICATION: VACCINE, 1997, V15, N12-13 (AUG-SEP), P1423-1429

GENUINE ARTICLE#: XV342

PUBLISHER: ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD, OXON, ENGLAND OX5 1GB

ISSN: 0264-410X

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The objective of these experiments was to study the serum antibody responses of cattle to partially purified, native *Pasteurella haemolytica* A1 leukotoxin (LKT) formulated with a commercial aluminum hydroxide-DDA-bromide adjuvant. In two experiments, calves received two intramuscular injections 21 day's apart and sera were obtained periodically. Serum antibody responses to *P. haemolytica* **outer membrane** proteins (OMPs), formalinized *P. haemolytica*, and LKT were determined. In Experiment A, Holstein calves (140 kg each) were vaccinated with either 10, 1.0 or, 0.1 mu g of LKT, 10(9) c.f.u. of live *P. haemolytica*, or adjuvanted diluent. In Experiment B, mixed-breed beef calves (200 kg each) were vaccinated with either 100, 50 or 10 mu g of LKT, 10(9) c.f.u. live *P. haemolytica*, or adjuvanted diluent. Vaccination of dairy calves with 10 mu g of partially purified LKT stimulated LKT neutralizing antibody responses similar to those stimulated by vaccination of one calf with live *P. haemolytica*. In Experiment B, which used larger and different breeds of cattle, two vaccinations 3 weeks apart with 50 mu g LKT stimulated LKT neutralizing responses equivalent to or greater than those stimulated by vaccination with live *P. haemolytica*. In both experiments, LKT vaccines stimulated only low

antibody responses to formalinized *P. haemolytica* O1 to OMPs.
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12/3,AB/12 (Item 11 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
(c) 2004 Inst for Sci Info. All rts. reserv.

08206840 References: 58

TITLE: **Outer membrane** proteins of bovine *Pasteurella multocida* serogroup A isolates

AUTHOR(S): Dabo SM (REPRINT); **Confer AW; Murphy GL**

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL & PHARMACOL/STILLWATER//OK/74078 (REPRINT)

PUBLICATION TYPE: JOURNAL

PUBLICATION: VETERINARY MICROBIOLOGY, 1997, V54, N2 (FEB), P167-183

GENUINE ARTICLE#: WJ620

PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

ISSN: 0378-1135

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The **outer membrane** proteins (OMPs) of *P. multocida* serotypes A3 (7 isolates), A4 (2 isolates), A3,4 and A2 (one isolate each) obtained from pneumonic cattle (10 isolates) and from one pig isolate were investigated to identify potential immunogens. SDS-PAGE of *P. multocida* OM isolated by SDG centrifugation of spheroplasts revealed eight major OMPs. **Outer membranes** isolated by sarcosyl extraction or SDG had similar protein composition on Coomassie blue-stained SDS-PA gel and on immunoblots. Two major OMPs (M(r)s of 35 and 46 kDa at 100 degrees C) demonstrated heat modifiability with apparent M(r)s of 30 and 34 kDa at 37 degrees C, respectively. The N-terminal aa sequences of these heat modifiable proteins revealed homology with *E. coli* **OmpA** and Hib P1 proteins, respectively. Protease treatment of whole cells followed by western immunoblots using bovine convalescent sera identified several immunogenic, surface-exposed and conserved OMPs among the eleven *P. multocida* isolates examined. The whole organism SDS-PAGE profiles of the eleven *P. multocida* isolates differed such that six patterns were seen. These patterns could potentially be used as a typing system for *P. multocida* bovine isolates based on the molecular weights of whole cell proteins. The above observations have potentially important implications relative to the immunity to infection.

12/3,AB/13 (Item 12 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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08062479 References: 55

TITLE: Purification and partial characterization of the **OmpA** family of proteins of *Pasteurella haemolytica*

AUTHOR(S): Mahasreshti PJ; **Murphy GL**; Wyckoff JH; Farmer S; Hancock REW; **Confer AW (REPRINT)**

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL & PHARMACOL/STILLWATER//OK/74078 (REPRINT); OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL & PHARMACOL/STILLWATER//OK/74078; OKLAHOMA STATE UNIV, COLL VET MED, DEPT INFECT DIS & PHYSIOL/STILLWATER//OK/74078; UNIV BRITISH COLUMBIA, DEPT MICROBIOL/VANCOUVER/BC V6T 1Z3/CANADA/

PUBLICATION TYPE: JOURNAL

PUBLICATION: INFECTION AND IMMUNITY, 1997, V65, N1 (JAN), P211-218

GENUINE ARTICLE#: WA609

PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW, WASHINGTON, DC 20005-4171

ISSN: 0019-9567

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: This study was conducted to partially characterize and identify

the purity of two major **outer membrane** proteins (OMPs) (with molecular weights of 32,000 and 35,000 [32K and 35K, respectively]) of *Pasteurella haemolytica*. The 35K and 32K major OMPs, designated *Pasteurella* **outer membrane** proteins A and B (PomA and PomB, respectively), were extracted from *P. haemolytica* by solubilization in N-octyl polyoxyl ethylene. The *P. haemolytica* strain used was a mutant serotype A1 from which the genes expressing the 30-kDa lipoproteins had been deleted, PomA and PomB were separated and partially purified by anion-exchange chromatography. PomA but not PomB was heat modifiable, The N-terminal amino acid sequences of the two proteins were determined and compared with reported sequences of other known proteins, PomA had significant N-terminal sequence homology with the **OmpA** protein of *Escherichia coli* and related proteins from other gram-negative bacteria, Moreover, polyclonal antiserum raised against the *E. coli* **OmpA** protein reacted with this protein. PomA was surface exposed, was conserved among *P. haemolytica* biotype A serotypes, and had porin activity in planar bilayers, No homology between the N-terminal amino acid sequence of PomB and those of other known bacterial proteins was found, Cattle vaccinated with live *P. haemolytica* developed a significant increase in serum antibodies to partially purified PomA, as shown by enzyme-linked immunosorbent assays, and to purified PomA and PomB, as detected on Western blots and by densitometry.

12/3,AB/14 (Item 13 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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07795743 References: 45

TITLE: Antibody responses of cattle to **outer membrane** proteins of *Pasteurella multocida* A:3

AUTHOR(S): **Confer AW**; Nutt SH; Dabo SM; Panciera RJ; **Murphy GL**
 CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT ANAT PATHOL & PHARMACOL/STILLWATER//OK/74078 (REPRINT)

PUBLICATION TYPE: JOURNAL

PUBLICATION: AMERICAN JOURNAL OF VETERINARY RESEARCH, 1996, V57, N10 (OCT), P1453-1457

GENUINE ARTICLE#: VK858

PUBLISHER: AMER VETERINARY MEDICAL ASSOC, 1931 N MEACHAM RD SUITE 100, SCHAUMBURG, IL 60173-4360

ISSN: 0002-9645

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Objective-To quantify the serum antibody responses to *Pasteurella multocida* A:3 **outer membrane** proteins (OMP) for cattle vaccinated with the homologous serogroup and to correlate those responses with the extent of experimentally induced pneumonia.

Animals-29, 5- to 8-month-old beef-type calves.

Procedure-Calves were vaccinated SC or by aerosol exposure on days 0 and 7 with live or killed *P. multocida* or phosphate-buffered saline solution (control) and subsequently challenge exposed with virulent *P. multocida*. Antibody responses to *P. multocida* A:3 **outer membranes** were quantified, using an ELISA. Antibody responses to individual OMP were detected by immunoblot analysis (western blot) and were quantified by densitometry. Antibody responses were compared among groups of calves and for various times after vaccination. Regression analyses were used to determine whether significant correlations existed between lesion scores and antibody responses to either whole **outer membranes** or to individual OMP.

Results-By ELISA, antibody responses to **outer membranes** for calves aerosolvaccinated with live *P. multocida* were significantly ($P < 0.05$) greater than those for control calves or for killed *P. multocida* vaccinates. There was a significant ($P < 0.05$) correlation between lesion score and antibody responses to **outer membranes**. By western

blotting and densitometry, antibodies to 11 prominent OMP (100, 97, 90, 85, 74, 53, 46, 35, 32, 21, and 16 kd) were identified and quantified. In experiment 1, SC vaccination with live P multocida increased antibody binding to all protein bands except 85-, 74-, and 35-kd bands, Aerosol vaccination with live P multocida stimulated increases in antibody binding to all bands except 100 and 16 kd. Antibody responses to the 97-, 90-, 74-, and 35- kd bands were significantly ($P < 0.05$) greater for live aerosol vaccinates than for control calves. In experiment 2, antibody responses were not different between the killed P multocida vaccinates or control calves. Antibody responses for live P multocida aerosol vaccinates were significantly ($P < 0.05$) greater than those for control calves for the 100-, 90-, 85-, 74-, 53-, 35-, and 16-kd bands. Regression analyses indicated significant correlations ($P < 0.05$) between lesion score and antibody responses to the 100-, 90-, 53-, 46-, 35-, and 32-kd OMP.

Conclusions—Several OMP of P multocida type A:3 may be important for stimulating immunity to the organism in cattle.

12/3,AB/15 (Item 14 from file: 440)
DIALOG(R) File 440:Current Contents Search(R)
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07676159 References: 23

TITLE: Genetic and immunological analyses of a 38kDa surface-exposed lipoprotein of *Pasteurella haemolytica* A1

AUTHOR(S): Pandher K (REPRINT) ; Murphy GL

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PATHOL, 250 VET MED BLDG/STILLWATER//OK/74078 (REPRINT); OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PATHOL/STILLWATER//OK/74078

PUBLICATION TYPE: JOURNAL

PUBLICATION: VETERINARY MICROBIOLOGY, 1996, V51, N3-4 (AUG), P331-341

GENUINE ARTICLE#: VD360

PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS

ISSN: 0378-1135

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: *Pasteurella haemolytica* serotype A1 is the bacterial pathogen most frequently isolated from the lungs of cattle with bovine respiratory disease. As part of a study to characterize P. *haemolytica* antigens which are important in eliciting resistance to pneumonic pasteurellosis, we have cloned and sequenced the gene encoding a 38 kDa lipoprotein, Lpp38. The deduced amino acid sequence of Lpp38 is similar to those of the *Escherichia* polyamine transport proteins PotD (70%) and PotF (33%). P. *haemolytica* Lpp38 is present in both inner membrane and outer membrane fractions of the cell envelope. Susceptibility of Lpp38 to cleavage by extracellular proteases indicates that portions of the protein are surface-exposed. A protein of similar molecular mass in P. *haemolytica* strains from all 12 serotypes of biotype A acid in an untypeable strain was detected by an anti-Lpp38 monoclonal antibody. Lpp38 is recognized by sera from calves resistant to infection after natural exposure to P. *haemolytica* and by sera from calves protected against infection by vaccination with P. *haemolytica* A1 outer membranes or with live bacteria. These data suggest a role for this protein in the development of immunity to P. *haemolytica* infection.

12/3,AB/16 (Item 15 from file: 440)
DIALOG(R) File 440:Current Contents Search(R)
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07676158 References: 19

TITLE: Major outer membrane proteins of *Pasteurella*

haemolytica serovars 1-15: Comparison of separation techniques and surface-exposed proteins on selected serovars

AUTHOR(S): Morton RJ (REPRINT) ; Simons KR; Confer AW

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PARASITOL
 MICROBIOL & PUBL HLTH/STILLWATER//OK/74078 (REPRINT); OKLAHOMA STATE
 UNIV, COLL VET MED, DEPT PATHOL/STILLWATER//OK/74078
 PUBLICATION TYPE: JOURNAL
 PUBLICATION: VETERINARY MICROBIOLOGY, 1996, V51, N3-4 (AUG), P319-330
 GENUINE ARTICLE#: VD360
 PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
 ISSN: 0378-1135
 LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The Sarkosyl method of obtaining **outer membrane** proteins (**OMPs**) from *Pasteurella haemolytica* A1 was more efficient and less laborious than separating membranes by sucrose gradient centrifugation. More **OMPs** were recovered and major **OMPs** were present in greater concentrations in the Sarkosyl-derived preparations. Therefore, **OMPs** of *P. haemolytica* serovars 1-15 (serovars 3, 4, 10, and 15 being T biotypes and the remainder being A biotypes) were prepared by the Sarkosyl method and compared by SDS-PAGE. Serovars 1, 2, 5, 6, 7, 8, 11, and 12 which are A biovars had similar **OMP** profiles characterized by major **OMPs** of 30.5 and 43 kDa. Biovar T strains were characterized by doublet protein bands in the 26-28 kDa region and a major **OMP** in the 38-40 kDa range. Serovars 9, 13, and 14, which are also A biovars, had profiles similar, although not identical, to the T biovars. A 43 kDa protein was present in all serovars although concentration was greater in the A biovars. Surface-exposed proteins of *P. haemolytica* A1 determined by I-125-labeling of whole cells were 94, 84, 53.5, 49, 43, 41, 29.5, and 16 kDa. Iodine-labeling of serovars A2 and A6 which have similar **OMP** profiles by SDS-PAGE resulted in autoradiographs indistinguishable from A1. These studies expand our knowledge of *P. haemolytica* **OMPs** especially showing the utility of the Sarkosyl extraction procedure, variations in **OMP** profiles among some A biovar strains, and the similarities of **OMP** profiles and surface-labeled proteins among three of the most important serovars (1, 2, and 6).

12/3, AB/17 (Item 16 from file: 440)
 DIALOG(R) File 440: Current Contents Search(R)
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06597946 References: 28

TITLE: VACCINATION OF CATTLE WITH **OUTER MEMBRANE**

PROTEIN-ENRICHED FRACTIONS OF PASTEURELLA **HAEMOLYTICA** AND
 RESISTANCE AGAINST EXPERIMENTAL CHALLENGE EXPOSURE

AUTHOR(S): MORTON RJ; PANCIERA RJ; FULTON RW; FRANK GH; EWING SA; HOMER JT;
 CONFER AW

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PARASITOL
 MICROBIOL & PUBL HLTH/STILLWATER//OK/74078 (Reprint); OKLAHOMA STATE
 UNIV, COLL VET MED, DEPT PATHOL/STILLWATER//OK/74078; USDA, NATL ANIM DIS
 CTR/AMES//IA/50010

PUBLICATION: AMERICAN JOURNAL OF VETERINARY RESEARCH, 1995, V56, N7 (JUL)
 , P875-879

GENUINE ARTICLE#: RJ860

ISSN: 0002-9645

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: Administration of an N-lauroylsarcosine - derived **outer membrane** protein fraction of *Pasteurella haemolytica* A1 (SCI-1) induced a protective response in calves against intrathoracic challenge exposure with the homologous serovar. **Outer membrane** proteins from heterologous serovars, A6 and A9, induced partial protection that was associated with their respective similarities to serovar A1 in **outer membrane** protein profiles derived by use of sodium dodecyl sulfate-polyacrylamide gel electrophoresis. Calves vaccinated with sci1 preparations did not have detectable neutralizing antibody to *P. haemolytica* A1 leukotoxin. Antibodies to whole-cell antigens, carbohydrate-protein subunit antigen, and SCI-1 were associated with

resistance, which indicates that protein antigens shared among cell surface, carbohydrate-protein subunit, and SCI preparations are immunogenic and enhance resistance to experimental challenge exposure.

12/3,AB/18 (Item 17 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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06593803 References: 35

TITLE: SERUM ANTIBODY RESPONSES OF CATTLE TO IRON-REGULATED OUTER

MEMBRANE PROTEINS OF PASTEURRELLA HAEMOLYTICA A1

AUTHOR(S): CONFER AW; MCCRAW RD; DURHAM JA; MORTON RJ; PANCIERA RJ

CORPORATE SOURCE: OKLAHOMA STATE UNIV,DEPT VET PATHOL/STILLWATER//OK/74078

(Reprint)

PUBLICATION: VETERINARY IMMUNOLOGY AND IMMUNOPATHOLOGY, 1995, V47, N1-2 (JUL), P101-110

GENUINE ARTICLE#: RK669

ISSN: 0165-2427

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: Serum antibody responses to the 70, 77, and 100 kDa iron-regulated outer membrane proteins (IROMPs) of *Pasteurella haemolytica* A1 were studied in cattle vaccinated with outer membrane protein (OMP) enriched outer membrane fraction, IROMP-enriched outer membrane fraction or live *P. haemolytica*. Vaccination with an IROMP-enriched outer membrane fraction stimulated antibodies to the 70 kDa IROMP, whereas vaccination with live *P. haemolytica* stimulated antibodies to the 70 and 77 kDa IROMPs. In a second experiment, sera were used from cattle vaccinated with live or killed *P. haemolytica* and subsequently challenged. Significant antibody responses to OMP- and IROMP-enriched outer membrane fractions were detected by an enzyme-linked immunosorbent assay (ELISA) for cattle vaccinated with bacterins or live *P. haemolytica*. Regression analysis indicated significant correlations between high antibody responses to the OMP- or IROMP-enriched fraction and resistance to challenge. Antibody responses to the 70 and 77 kDa IROMPs were significantly greater for the live *P. haemolytica* vaccinates than for PBS control vaccinates. There was no significant correlation between antibody responses to individual IROMPs and resistance or susceptibility to challenge. These data suggest that antibodies to IROMPs alone are probably not responsible for protective immunity against pneumonic pasteurellosis. Antibodies to IROMPs, however, in conjunction with antibodies to other surface antigens probably enhance immunity to *P. haemolytica* challenge.

12/3,AB/19 (Item 18 from file: 440)
 DIALOG(R)File 440:Current Contents Search(R)
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05971643 References: 16

TITLE: EXPRESSION, PURIFICATION AND IMMUNOLOGIC ANALYSIS OF THREE

PASTEURRELLA HAEMOLYTICA A1 28-30 KDA LIPOPROTEINS

AUTHOR(S): DABO SM; CONFER AW; STYRE D; MURPHY GL (Reprint)

CORPORATE SOURCE: OKLAHOMA STATE UNIV,COLL VET MED,DEPT VET

PATHOL/STILLWATER//OK/74078 (Reprint); OKLAHOMA STATE UNIV,COLL VET

MED,DEPT VET PATHOL/STILLWATER//OK/74078

PUBLICATION: MICROBIAL PATHOGENESIS, 1994, V17, N3 (SEP), P149-158

GENUINE ARTICLE#: PU890

ISSN: 0882-4010

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: Three genes, tandemly arranged on the *Pasteurella haemolytica* A1 chromosome and encoding similar 28-30 kDa proteins, were previously cloned and sequenced by our laboratory. In this study, we demonstrate that the

cloned genes encode lipoproteins, as previously suggested by DNA sequence analysis. To further analyze the bovine immune response to these proteins, the individual genes were cloned separately into an expression vector and recombinant forms of the three proteins were purified after expression in *Escherichia coli*. Sera from cattle vaccinated with live *P. haemolytica* or *P. haemolytica* bacterins and from cattle naturally exposed to *P. haemolytica* recognized each of the recombinant proteins. Vaccination with live or killed whole bacteria did not elicit an immune response of the same quality as that which developed in response to natural infection. A statistically significant correlation existed between resistance to challenge and a high antibody response to one of these three proteins.

12/3,AB/20 (Item 19 from file: 440)
 DIALOG(R) File 440:Current Contents Search(R)
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05094671 References: 75

TITLE: IMMUNOGENS OF PASTEURELLA

AUTHOR(S): **CONFER AW**

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET

PATHOL/STILLWATER//OK/74078 (Reprint)

PUBLICATION: VETERINARY MICROBIOLOGY, 1993, V37, N3-4 (NOV), P353-368

GENUINE ARTICLE#: MM915

ISSN: 0378-1135

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: The family Pasteurellaceae Pohl contains Gram-negative, facultatively anaerobic and fermentative bacteria of the genera *Pasteurella*, *Haemophilus*, and *Actinobacillus*. Approximately 20 different species of the genus *Pasteurella* have been identified using phenotypic and genetic analyses. Of these species, *P. multocida* and *P. haemolytica* are the most prominent pathogens in domestic animals causing severe diseases and major economic losses in the cattle, swine, sheep, and poultry industries. Mechanisms of immunity to these bacteria have been difficult to determine, and efficacious vaccines have been a challenge to develop and evaluate.

Pasteurella multocida of serogroups A and D are mainly responsible for disease in North American poultry and pigs and to a lesser extent in cattle. Fowl cholera in chickens and turkeys is caused by various serotypes of *P. multocida* serogroup A and characterized by acute septicemia and fibrinous pneumonia or chronic fibrinopurulent inflammation of various tissues. Current biologicals in use are live *P. multocida* vaccines and bacterins. Potency tests for avian *P. multocida* biologicals are a bacterial colony count for vaccines and vaccination and challenge of birds for bacterins. Somatic antigens, particularly lipopolysaccharide (LPS), appear to be of major importance in immunity. In North American cattle, *P. multocida* serogroup A is associated mainly with bronchopneumonia (enzootic pneumonia) in young calves; however, it is occasionally isolated from fibrinous pleuropneumonia of feedlot cattle (shipping fever). Biologicals currently available are modified-live vaccines and bacterins. The potency test for vaccines is bacterial colony counts. The test for bacterin potency is vaccination and challenge of mice. Important immunogens have not been well characterized for *P. multocida* infection in cattle. In swine, *P. multocida* infection is sometimes associated with pneumonia; however, its major importance is in atrophic rhinitis. A protein toxin (dermonecrotic toxin), produced by toxigenic strains of *P. multocida* types A and D, and concurrent infection with *Bordetella bronchiseptica* appear to be the major factors in development of atrophic rhinitis. Currently available biologicals are bacterins and inactivated toxins (toxoids). The toxin appears to be the major immunogen for preventing atrophic rhinitis. There are, however, no standardized requirements for potency testing of *P. multocida* type D toxoid.

Various serotypes of *P. haemolytica* biotype A are responsible for severe fibrinous pleuropneumonia of cattle and sheep, occasionally

septicemia of lambs, and mastitis in ewes. Several serotypes of *P. haemolytica* biotype T are isolated from acute septicemia of lambs. The currently available *P. haemolytica* biologicals are modified-live vaccines, bacterins, bacterial surface extracts, and culture supernates that contain an exotoxin (leukotoxin). Most biologicals contain *P. haemolytica* biotype A serotype 1; however, biotype T serotypes 3 and 4 are occasionally included. As with *P. multocida* vaccines, the potency test for a *P. haemolytica* vaccine is a bacterial colony count. There are no standard guidelines for potency tests for *P. haemolytica* bacterins or extracts and supernate biologicals. The major immunogens for *P. haemolytica* appear to be the leukotoxin, capsule, **outer membrane** proteins, and iron-regulated proteins.

12/3,AB/21 (Item 20 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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04756972 References: 8

TITLE: ANALYSIS OF TANDEM, MULTIPLE GENES ENCODING 30-KDA MEMBRANE PROTEINS IN PASTEURELLA-HAEMOLYTICA A1

AUTHOR(S): MURPHY GL; WHITWORTH LC

CORPORATE SOURCE: OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PATHOL/STILLWATER//OK/74078 (Reprint)

PUBLICATION: GENE, 1993, V129, N1 (JUL 15), P107-111

GENUINE ARTICLE#: LQ872

ISSN: 0378-1119

LANGUAGE: ENGLISH DOCUMENT TYPE: NOTE

ABSTRACT: A number of **outer membrane** proteins (OMPs), including a 30-kDa protein, may be important in eliciting immunity to Pasteurella *haemolytica* A1, the causative agent of bovine pneumonic pasteurellosis. To better understand the nature of the 30-kDa antigen, several genes encoding this protein were sequenced. Sequence analysis revealed that three separate genes encoding similar, yet distinct, versions of the 30-kDa protein are tandemly arranged on the *P. haemolytica* A1 chromosome. The genes appear to be transcribed from a single promoter. The deduced amino acid sequences of the proteins encoded by these genes are similar to a 28-kDa inner membrane lipoprotein of Escherichia coli and a 28-kDa membrane protein which may contribute to the virulence of Haemophilus influenzae type b strains.

12/3,AB/22 (Item 21 from file: 440)
DIALOG(R)File 440:Current Contents Search(R)
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03752266 References: 23

TITLE: COMPARISON OF ANTIBODY RESPONSES IN CATTLE TO **OUTER MEMBRANE** PROTEINS FROM PASTEURELLA-HAEMOLYTICA SEROTYPE-1 AND FROM 8 UNTYPEABLE STRAINS

AUTHOR(S): SIMONS KR; MORTON RJ; FULTON RW; CONFER AW

CORPORATE SOURCE: DEPT PATHOL, VET CLIN SCI BLDG/MANHATTAN//KS/66506 (Reprint); OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET

PARASITOL/STILLWATER//OK/74078; OKLAHOMA STATE UNIV, COLL VET MED, DEPT MICROBIOL& PUBL HLTH/STILLWATER//OK/74078; OKLAHOMA STATE UNIV, COLL VET MED, DEPT VET PATHOL/STILLWATER//OK/74078

PUBLICATION: AMERICAN JOURNAL OF VETERINARY RESEARCH, 1992, V53, N6 (JUN), P971-975

GENUINE ARTICLE#: HY072

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: Membrane associated proteins from 8 untypeable Pasteurella *haemolytica* strains were separated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis and compared with those of *P. haemolytica* serotypes 1 and 2. Cattle antisera obtained from *P.*

haemolytica serotype 1 vaccine trials were used in immunoblotting assays to compare the membrane proteins from the 8 untypeable strains with those from **P haemolytica** serotypes 1 and 2. Densitometry was used to identify bands, and using linear regression analyses, the peak area optical densities (measuring antibody response) were correlated to lesion scores from the vaccinated calves. Significant antibody responses to proteins of 99, 69, 60, 55, 47, 45, 39, 33, 30, 16, and 14.5 kDa were detected for 4 or more of the 8 **P haemolytica** untypeable strains. Serotypes 1 and 2 of **P haemolytica** contained a comigrating 30-kDa protein. Antibody responses to proteins of 39, 33, and 32.5 kDa were significant for 3 of the untypeable strains and had significant correlation to lesion scores. Antibody responses to various other proteins were significant for 2 untypeable strains each.

12/3,AB/23 (Item 22 from file: 440)
 DIALOG(R) File 440:Current Contents Search(R)
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02671267 References: 28

TITLE: CLONING AND EXPRESSION OF A 30 KDA SURFACE ANTIGEN OF PASTEURILLA-
HAEMOLYTICA

AUTHOR(S): CRAVEN RC; CONFER AW; GENTRY MJ

CORPORATE SOURCE: LOUISIANA STATE UNIV, SCH MED, DEPT BIOCHEM & MOLEC
 BIOL/SHREVEPORT//LA/71130 (Reprint); OKLAHOMA STATE UNIV, COLL VET
 MED, DEPT BOT & MICROBIOL/STILLWATER//OK/74078; OKLAHOMA STATE UNIV, COLL
 VET MED, DEPT VET PATHOL/STILLWATER//OK/74078; OKLAHOMA STATE UNIV, COLL
 VET MED/STILLWATER//OK/74078

PUBLICATION: VETERINARY MICROBIOLOGY, 1991, V27, N1 (MAR), P63-78

GENUINE ARTICLE#: FB765

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: *Pasteurella haemolytica* biotype A serotype 1 is the principal etiologic agent of bovine pneumonic pasteurellosis. A clear understanding of the pathogenesis of this disease and the mechanisms of resistance to it has been limited by a lack of information on the important antigens of the organisms. Using recombinant DNA techniques we have cloned a segment of DNA from *P. haemolytica* A1 that encodes three proteins of 28, 30, and 32 kDa. Two of these proteins, 30 and 28 kDa, react strongly on a Western blot with a bovine serum raised against live cells of *P. haemolytica* A1. The gene for the 30 kDa protein was localized to a 3.1 kbp *EcoRI* fragment, and expression of the 30 kDa protein was found to be independent of an *E. coli* promoter. The 30 kDa protein comigrated with a 30 kDa *P. haemolytica* protein that was susceptible to radioiodination and presumably exposed on the bacterial cell surface. The other principal radiolabeled *P. haemolytica* proteins were 100, 45, and 15 kDa. Antibodies against the 30 kDa protein, isolated from *E. coli* carrying the recombinant plasmid, recognized 30 kDa and 15 kDa proteins in *P. haemolytica* serotypes 1-15 and caused agglutination of whole *P. haemolytica* A1 cells. Cattle vaccinated with live *P. haemolytica*, *P. haemolytica* outer membrane proteins, or the cloned 30 kDa protein developed antibodies to the cloned 30 kDa protein as detected by Western blotting and densitometry. Sera were obtained from cattle vaccinated with live or killed *P. haemolytica* or saline and challenged with *P. haemolytica*. Those sera were evaluated for antibody responses to the cloned 30 kDa protein. High antibody responses to the 30 kDa protein significantly correlated ($P < 0.01$) with resistance to challenge. From these studies it is concluded that the 30 kDa protein represents a surface antigen of *P. haemolytica* A1 that may be important in inducing immunity to *P. haemolytica*.

12/3,AB/24 (Item 1 from file: 348)
 DIALOG(R) File 348:EUROPEAN PATENTS
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01759926

i M. **HAEMOLYTICA** /i **OUTER MEMBRANE PROTEIN PLPE AS A**
VACCINE OR VACCINE COMPONENT AGAINST SHIPPING FEVER
 PROTEINE DE MEMBRANE EXTERNE DE I M. **HAEMOLYTICA** /I (PLPE) UTILISEE
 COMME COMPOSE VACCINAL CONTRE LA FIEVRE DES TRANSPORTS

PATENT ASSIGNEE:

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PATENT (CC, No, Kind, Date):

WO 2004041182 040521

APPLICATION (CC, No, Date): EP 2003786552 031030; WO 2003US34574 031030

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HU; IE; IT; LI; LU; MC; NL; PT; RO; SE; SI; SK; TR

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LANGUAGE (Publication,Procedural,Application): English; English; English

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 DIALOG(R)File 357:Derwent Biotech Res.
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0342930 DBR Accession No.: 2004-15222 PATENT

New vaccine compositions comprising a recombinant PlpE **outer**
membrane protein of M. **haemolytica** optionally in
 combination with at least one other antigen against M.
haemolytica, useful for preventing bovine respiratory disease -
 for use in cattle respiratory disease and shipping fever prevention

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PATENT ASSIGNEE: UNIV OKLAHOMA STATE 2004

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PRIORITY APPLIC. NO.: US 422305 APPLIC. DATE: 20021030

NATIONAL APPLIC. NO.: WO 2003US34574 APPLIC. DATE: 20031030

LANGUAGE: English

ABSTRACT: DERWENT ABSTRACT: NOVELTY - A vaccine composition against
 infection of M. **haemolytica** in cattle comprises: (a) recombinant
 PlpE **outer membrane** protein of M. **haemolytica** or its
 antigenic subunit; or (b) a recombinant PlpE **outer membrane**
 protein of M. **haemolytica** or its antigenic subunits, in
 combination with at least one other antigen against M.
haemolytica; and (c) a pharmaceutical carrier or diluent.
 BIOTECHNOLOGY - Preferred Composition: The carrier is an adjuvant. The
 recombinant PlpE **outer membrane** protein of M.
haemolytica comprises a polypeptide having a sequence of 337
 amino acids (SEQ ID NO: 2) given in the specification. The subunits are
 selected from 8 polypeptides having a sequence of 13-43 amino acids
 (SEQ ID NOS: 11-18) given in the specification. ACTIVITY -
 Antibacterial; Immunostimulant. MECHANISM OF ACTION - Vaccine. Sera
 from 18 cattle were used. Serum antibodies to PlpE were determined on
 samples from the day of vaccination (day 0) and from day 14. one day 0,
 3 calves each were vaccinated subcutaneously with one of the following
 commercially vaccines: P. **haemolytica** Toxoid, BRSV-BVD-IBR-PI3
 vaccine (PRESPONSE), P. **haemolytica**-multocida Bacterin-Toxoid
 (PULMOGUARD), P. **haemolytica** -multocida-Salmonella typhimurium
 Bacterin-Toxoid (POLY-BAC B). Three calves were each vaccinated 2 mg of

M. haemolytica. Sera were analyzed from 3 non-vaccinated calves that spontaneously seroconverted to **M. haemolytica** based on positive antibody responses to WC-LKT. Results show that vaccination of calves with commercial vaccines, **M. haemolytica outer membranes**, and live **M. haemolytica** resulted in a non-significant increase in antibodies to PlpE. Natural exposure to **M. haemolytica** however resulted in a significant increase in anti-PlpE antibodies. All vaccine-induced responses and natural exposure were substantially less than the antibodies produced in a calf vaccinated with 100 microg of rPlpE in commercial adjuvant. Antibody responses to **M. haemolytica** LKT and WC significantly increased for PULMOGUARD and the live bacteria-vaccinated and natural exposure calves, while vaccination with **outer membranes** stimulated a significant antibody response to WC. USE - The vaccine is useful against infection of **M. haemolytica** in cattle, or for inducing an immune response in cattle to provide immune protection against bovine respiratory disease and/or shipping fever to an at-risk bovine (claimed). ADMINISTRATION - Dosage is 10-100 microg, preferably 100 microg, of recombinant PlpE **outer membrane** protein of **M. haemolytica** or its antigenic subunits (claimed). ADVANTAGE - The new vaccine provides better protection or immunization than existing commercially available vaccines. (48 pages)

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 DIALOG(R)File 357:Derwent Biotech Res.
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Immunogenicity of recombinant Mannheimia **haemolytica** serotype 1

outer membrane protein PlpE and augmentation of a commercial vaccine - recombinant protein production via plasmid expression for use in disease vaccine

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ABSTRACT: AUTHOR ABSTRACT - Mannheimia **haemolytica** is the major cause of severe bacterial pneumonia associated with shipping fever in cattle. The gene for **M. haemolytica outer membrane** protein (OMP) PlpE was cloned into the expression vector pRSETA. The cloned gene was then expressed in BL21(DE3)pLysS and the recombinant PlpE (rPlpE) was purified and used in immunological and vaccination studies. Vaccination of cattle with commercial **M. haemolytica** vaccines stimulated no significant (P andgt; 0.05) antibody responses to rPlpE. Recombinant PlpE in a commercial proprietary adjuvant was highly immunogenic when injected subcutaneously into cattle. Vaccination of cattle with 100 jig of rPlpE markedly enhanced resistance against experimental challenge with virulent **M. haemolytica**. Addition of 100 mug of rPlpE to a commercial **M. haemolytica** vaccine, Presponse(R) significantly enhanced (P andlt; 0.05) protection afforded by the vaccine against experimental challenge. Addition of rPlpE to commercial **M. haemolytica** vaccines could greatly enhance vaccine efficacy. (C) 2003 Elsevier Science Ltd. All rights reserved. (9 pages)

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